Conditionals

Types of Conditionals

A conditional in C can be written using if, $else$-if, $else$, ternary operators, and $switch$ statements.

if Statements

An if statement tests an expression and executes code based on its truth.

```c
if (x == 3) {
  printf("x is 3!");
}
```

else-if Statements

An $else$-if statement tests an expression and must come after an existing if or $else$-if.

```c
if (x > 3) {
  printf("x is greater than 3");
} else if (x < 3) {
  printf("x is less than 3");
}
```

else Statements

An `else` statement is accessed when all preceding `if` and/or `else-if` statements return `false`.

```
if (x > 3) {
  printf("x is greater than 3");
} else if (x < 3) {
  printf("x is less than 3");
} else {
  printf("x equals 3");
}
```

Dangling else Statement

A dangling `else` statement results when it's ambiguous which conditional the `else` statement is attached to.

Ternary Operators

A ternary operator is a condensed `if-else` statement.

```
min = a < b ? a : b; // This is t

if (a < b) {
  min = a;
} else {
  min = b;
}
```

switch Statements

A `switch` statement is a condensed series of cascading `else` statements. It tests a value and compares it against multiple cases.

```
switch (grade) {
  case 9:
    printf("Freshman\n");
    break;
  case 10:
    printf("Sophomore\n");
    break;
  case 11:
    printf("Junior\n");
    break;
  case 12:
    printf("Senior\n");
    break;
  default:
    printf("Invalid\n");
    break;
}
```

Operators and Conditionals

A conditional in C can use logical operators such as `&&` and `||` to test multiple expressions and `!` to negate an expression.

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